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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,748	02/20/2004	Jong-Sang Oh	P57023	3699

7590 03/09/2007

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EXAMINER	
CHAN, SAI MING	
ART UNIT	PAPER NUMBER
2609	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/781,748	OH ET AL.	
	Examiner	Art Unit	
	Sai-Ming Chan	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/20/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 2/20/2004 has been considered by the Examiner and made of record in the application file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 9 is rejected under 35 U.S.C. 102(e) as being anticipated by Choe **(U.S. Patent #7031320)**.

Consider **claim 9,** Choe clearly discloses and shows a router with a distributed architecture, comprised of:

a main processor (fig. 1(120)) updating routing information stored in a routing table (column 7, lines14-15) and broadcasting changes in said routing information (column 7, lines 14-19);

a plurality of line connection units (fig. 1 (110));

a switching unit (fig.1 (switch fabric)) directing transmission of packets between said main processor (fig. 1(120) and said line connection units (fig. 1 (110));

each of said line connection units comprising:

a forwarding table (fig.1 (FTs)) storing a copy of parts of said routing table (column 6, lines 53-55), and

a forwarding processor (fig.1 (each box with a FT); fig.3) making a discontinuance of transmission of any packet received by a corresponding one of said line connection units from said switching unit and designated by a destination address to be subsequently forwarded to said switching unit (column 6, lines 58-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 5-7 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Choe **(U.S.Patent #703132),** in view of **Chowdhury et al. (U.S. Patent Publication # 6631136).**

Consider **claim 1,** Choe clearly discloses and shows a distributed router (fig. 1; column 5, lines 44-46), comprising:
a plurality of line connection units (fig. 1 (110));
a main processor (fig. 1(120)) disposed to construct and manage a routing table (column 6, lines 40-47), receive changes of routing information from adjacent routers (column 6, lines 48-53), update the routing table (column 7, lines14-15), and broadcast changes (column 7, lines 14-19) of routing information received through internal InterProcessor Communication (fig. 4 (switch or ipc interface)) paths within the distributed router;
a switching unit (fig.1 (switch fabric)) coupled to switch transmission of packets between the line connection units and the main processor;
a plurality of forwarding tables (fig.1 (FTs)) positioned in different corresponding ones of the plurality of line connection units, to copy, store and manage parts of the routing table (column 6, lines 53-55); and
a plurality of forwarding processors (fig.1 (each box with a FT); fig.3) positioned in different corresponding ones of the plurality of line connection units, to receive the

changes of routing information broadcast by the main processor through the internal InterProcessorCommunication paths of the distributed router, update different corresponding ones of the forwarding tables (column 6, lines 53-55), to ascertain an output port conforming to said transmission by looking-up forwarding information in corresponding ones of the forwarding tables for packets received from external routers , and transmitting the packets to the output ports ascertained (fig.3; column 7, lines 31-38), to determine whether an output port of a packet received from the switching unit is connected to the external router or to the switching unit by looking-up the forwarding information in the corresponding forwarding table for the packet (column 7, lines 31-38), and to transmit the packet to the external router when the output port is connected to the external router (column 6, lines 58-64).

However Choe fails to disclose that the packet will be discarded if the output port is connected to the switch.

In the same field of endeavor, Chowdhury et al. clearly disclose that if the output port is the switch, the packets will not be routed (column 7, lines 60-67; column 8, lines 1-14).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a distributed router, as taught by Choe, and the implementation of loop prevention method, as taught by Chowdhury et al., so that the flow of packets in the distributed network will be enhanced.

Consider **claim 2,** and **as applied to claim 1 above,** Choe, as modified by Chowdhury et al., clearly discloses and shows the distributed router, wherein the main processor (fig.4) comprises:

a plurality of input/output interfaces (fig.4 (input/output interfaces)) handling packets transmitted and received to and from the switching unit;

a switch interface buffering packets transmitted and received via the input/output interfaces, and interfacing with the switching unit (column 7, lines 39-49); and
a routing table lookup and management unit receiving packets from the input/output interfaces through the switch interface, and transmitting packets received to the input/output interfaces in conformance with routing information stored in the routing table, and receiving the changes of routing information from external routers, updating the routing information with the changes of routing information, and transmitting updated routing information to the forwarding processors through the internal Interprocessor Communication paths of the distributed router(fig.4;column 7, lines 39-49).

Consider **claim 5,** Choe, clearly discloses and shows a distributed router, comprising:
a step 1 in the distributed router having a switch unit (fig.1 (switch fabric)) connecting a main processor (fig.1 (120)) and a plurality of line connection units (fig. 1 (110)), of the main processor updating a routing table (column 7, lines14-15), and transmitting changes of routing information to respective line connection units through internal paths of the distributed router (column 7, lines 14-19), when the main processor receives changes of routing information from an adjacent router (column 6, lines 48-53);
a step 2 of a forwarding processor (fig.1 (each box with a FT); fig.3) positioned in each of the line connection units updating a forwarding table in response to reception of the changes of routing information broadcast from the main processor through the internal paths of the distributed router(column 6, lines 53-55) ; and
a step 3 of the forwarding processor receiving a packet from one of an external router and the switching unit, ascertaining input and output ports of the packet, and transmitting the packet when the input and output ports are not connected to the switching unit .

However Choe fails to disclose that the packet will be discarded if the output port is connected to the switch.

In the same field of endeavor, Chowdhury et al. clearly disclose that if the output port is the switch, the packets will not be routed (column 7, lines 60-67; column 8, lines 1-14).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a distributed router, as taught by Choe, and the implementation of loop prevention method, as taught by Chowdhury et al., so that the flow of packets in the distributed network will be enhanced.

Consider **claim 6,** and **as applied to claim 5 above,** Choe, as modified by Chowdhury et al., clearly discloses and shows the method, wherein step 1 of updating the routing table, comprises:

a step 1-1 with the main processor (fig. 1(120)) updating the routing table (column 7, lines14-15) when the main processor receives the changes of routing information (column 6, lines 48-53);

a step 1-2 with the main processor adjusting changes (column 7, lines14-19) in a routing path to fit the forwarding table of each of the line connection units; and

a step 1-3 with the main processor transmitting the changes (column 7, lines 14-19) of the routing information to the respective line connection units through the internal paths (fig. 4 (switch or ipc interface)) of the distributed router.

Consider **claim 7,** and **as applied to claim 5 above,** Choe, as modified by Chowdhury et al., clearly discloses and shows the method, wherein step 3 of the forwarding processor ascertaining input and output ports, comprises:

a step 3-1 with the forwarding processor ascertaining the output port of the packet received from an external router by searching the forwarding table for the packet and transmitting the packet to the output port ascertained (column 7, lines 31-38);
a step 3-2 with the forwarding processor ascertaining the output port of the packet received by searching the forwarding table for the output port of the packet received from the switching unit, and transmitting the packet when the output port is an external router(column 6, lines 58-64); and

However Choe fails to disclose that the packet will be discarded if the output port is the switch unit.

In the same field of endeavor, Chowdhury et al. clearly disclose that if the output port is the switch, the packets will not be routed (column 7, lines 60-67; column 8, lines 1-14).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a distributed router, as taught by Choe, and the implementation of loop prevention method, as taught by Chowdhury et al., so that the flow of packets in the distributed network will be enhanced.

Consider **claim 4,** Choe clearly discloses and shows a distributed router (fig. 1; column 5, lines 44-46), comprising:
a plurality of line connection units (fig. 1 (110));
a plurality of main processors (fig.1 (120)) positioned in corresponding different ones of the plurality of line connection units, to construct and manage a routing table (column 6, lines 40-47), receive changes in routing information from adjacent routers (column 6, lines 48-53), update the routing table (column 7, lines14-15), and broadcast changes (column 7, lines 14-19) of routing information through IPC paths (fig. 4 (switch or ipc

interface)) of the distributed router;

a switching unit (fig.1 (switch fabric)) switching packets received from the line connection units to corresponding ones of the line connection units to which these packets are transmitted;

a plurality of forwarding tables (fig.1 (FTs)) positioned in corresponding different ones of the plurality of line connection units, to copy, store and manage parts of the routing table (column 6, lines 53-55); and

a plurality of forwarding processors (fig.1 (each box with a FT); fig.3) positioned in corresponding different ones of the plurality of line connection units, to ascertain an output port by making a lookup in the forwarding table for a packet received from an external router and transmit the packet received to the output port ascertained (fig.3; column 7, lines 31-38), to determine whether an output port of a packet input from the switching unit is connected to the external router or switching unit by making a search of forwarding information stored in the forwarding table for the packet (column 7, lines 31-38), transmit the packet to the external router when the output port is connected to the external router (column 6, lines 58-64), and update the forward table in response to reception of changes in routing information broadcast by the main processor through the internal IPC paths of the distributed router tables (column 6, lines 53-55).

However Choe fails to disclose that the packet will be discarded if the output port is the switch unit.

In the same field of endeavor, Chowdhury et al. clearly disclose that if the output port is the switch, the packets will not be routed (column 7, lines 60-67; column 8, lines 1-14).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a distributed router, as taught by Choe,

and the implementation of loop prevention method, as taught by Chowdhury et al., so that the flow of packets in the distributed network will be enhanced.

Consider **claim 10,** and **as applied to claim 9 above,** Choe, as modified by Chowdhury et al., clearly discloses and shows the router, with said forwarding processor comprised of:

when the packet has been received from said switching unit and said destination address indicates an output port of said corresponding one of said line connection units coupled to an external router, transmitting the packet to the external router (column 6, lines 58-64), and

However Choe fails to disclose that the packet will be discarded if the output port is the switch unit.

In the same field of endeavor, Chowdhury et al. clearly disclose that if the output port is the switch, the packets will not be routed (column 7, lines 60-67; column 8, lines 1-14).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a distributed router, as taught by Choe, and the implementation of loop prevention method, as taught by Chowdhury et al., so that the flow of packets in the distributed network will be enhanced.

Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choe **(U.S. Patent #703132),** in view of **Chowdhury et al. (U.S. Patent Publication # 6631136),** and further in view of **Dobbins et al. (U.S. Patent #5751971).**

Consider **claim 3,** Choe, as modified by Chowdhury et al., clearly discloses and shows the distributed router, wherein a lookup table storing address indices for the forwarding tables where information on each packet is stored (fig.3; column 7, lines 31-38;
a lookup control unit (fig.3 (route lookup); column 7, lines 31-38 (route lookup controller)) latching the address of the forwarding table intended for reference from the lookup table using the IP address extracted by the IP header analyzing unit, reading forwarding information from the forwarding table, and making any one determination of packet transmission when an output port of the packet input from the switching unit is a port directed to an external router (column 6, lines 58-64);

However Choe fails to disclose that the packet will be discarded if the output port is the switch unit.

In the same field of endeavor, Chowdhury et al. clearly disclose that if the output port is the switch, the packets will not be routed (column 7, lines 60-67; column 8, lines 1-14).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a distributed router, as taught by Choe, and the implementation of loop prevention method, as taught by Chowdhury et al., so that the flow of packets in the distributed network will be enhanced.

However, Choe, as modified by Chowdhury et al., fails to disclose the how the

distributed router handles the IP header of a packet for route selction.

In the same field of endeavor, Dobbins et al. clearly show and disclose the distributed router, wherein each of the forwarding processors comprises:
an Internet Protocol packet receiving unit (fig.7, (112 FAS Object)) for extracting an IP header field from each incoming packet;
an IP header analyzing unit extracting an IP address required for lookup control from each IP header received from the Internet Protocol packet receiving unit (column 9, lines 65-67, column 10, lines 1-3; fig.7 (route_lookup));
an IP header changing unit changing information of the IP header of each packet based on the forwarding information obtained by the lookup control unit (column 9, lines 65-67; column 10, lines 1-7); and
an IP packet transmitting unit transmitting the stored packets according to the changes in information for the header of each packet to the external router (column 10, lines 8-13).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a distributed router, as taught by Choe, the implementation of loop prevention method, as taught by Chowdhury et al., and the method for packet header handling, as taught by Dobbins et al., so that the utilization of bandwidth will be greatly improved.

Consider **claim 8, as applied to claim 5 above,** Choe, as modified by Chowdhury et al., and further modified by Dobbins et al., clearly discloses and shows the method as described. However, Choe, as modified by Chowdhury et al., and further modified by Dobbins et al., fails to disclose how the IP header information is extracted

for route selection.

In the same field of endeavor, Dobbins et al. clearly show and disclose the forwarding processor receiving a packet from one of an external router and the switching unit, and ascertaining input and output ports of the packet in step 3 (fig. 7;column 9, lines 28-32; lines 61-63) comprises:
a step of the forwarding processor extracting an IP header (column 9, lines 65-67, column 10, lines 1-3) from an incoming IP packet;
a step of the forwarding processor extracting an IP address for lookup control (column 9, lines 65-67, column 10, lines 1-3; fig.7 (route_lookup)) from the IP header; and
a step of the forwarding processor ascertaining the output port by using the IP address to make a search of forwarding table (column 10, lines 3-5) using the IP address.

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a distributed router, as taught by Choe, as modified by Chowdhury et al., and the method for packet header handling, as taught by Dobbins et al., so that the utilization of bandwidth will be greatly improved.

Conclusion

Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to**:

Commissioner for Patents
P.O. Box 1450
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Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Sai-Ming Chan whose telephone number is (571) 270-1769. The Examiner can normally be reached on Monday-Thursday from 6:30am to 5:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Rafael Pérez-Gutiérrez can be reached on (571) 272-7915. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 571-272-4100.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Sai-Ming Chan
S.C./ sc

March 2, 2007

RAFAEL PEREZ-GUTIERREZ
SUPERVISORY PATENT EXAMINER
3/2/07